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OCT 06 2006

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In the application of: Estes et al.

Serial No: 10/027,160

Group Art Unit: 1751

Examiner: Gregory E. Webb

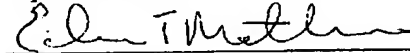
Filed: December 20, 2001

For: NON-AQUEOUS WASHING  
APPARATUS AND METHOD

Docket No. : US19984054-3 (094342.0038)

**CERTIFICATE OF FACSIMILE  
TRANSMISSION**

I hereby certify that this correspondence was transmitted to the United States Patent and Trademark Office via facsimile on October 6, 2006 to phone number 571-273-8300.



Eileen T. Mathews

**DECLARATION OF TREMITCHELL WRIGHT  
UNDER 37 C.F.R. §1.132**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, Tremitchell Wright, declare and say as follows:

(1) I am a U.S. citizen and reside at 53667 Springmill Drive, Elkhart, Indiana, 46514.

(2) I have received the following degrees: a Bachelor of Science Degree in Chemical Engineering from Tuskegee University, Tuskegee, AL in 1983; and a Master of Science Degree in Chemical Engineering from the University of New Mexico in Albuquerque, NM in 1985.

Application Number: 10/027,160  
Response Dated: October 6, 2006

(3) I have been working in the field of chemical research for at least 10 years and currently hold the position of Lead Engineer at Whirlpool Corporation.

(4) I have been working in research in the field of non-aqueous laundering of fabrics for at least 12 years at Whirlpool Corporation.

(5) I am one of the inventors for United States Patent Application No. 10/027, 160 (hereinafter USSN 10/027,160).

(6) I have been asked to comment on the nature of the disclosure contained in U.S. Patent No. 5,093,031 (Login, et al.), U.S. Patent No. 5,294,644 (Login, et al.), U.S. Patent No. 5,269,958 (de Jager, et al.), U.S. Patent No. 5,427,858 ( Nakamura, et al.), U.S. Patent No. 5,505,985 ( Nakamura, et al.), U.S. Patent No. 5,676,005 (Balliett, et al.), U.S. Patent No. 5,962,390 ( Flynn, et al.), U.S. Patent No. 5,238,587 (Smith, et al.) all of which are currently of record in USSN 10/027,160, and on what a person skilled in the art would understand by the disclosure contained in these references.

(7) I have read U.S. Patent Nos. 5,093,031 and 5,294,644 (Login, et al.); 5,269,958 (de Jager, et al.); 5,427,858 and 5,505,985 ( Nakamura, et al.); 5,676,005 (Balliett, et al.); 5,962,390 (Flynn, et al.); and 5,238,587 (Smith et al.), and hereby comment on each of them as each relates to the composition of wash liquor.

(8) In view of the above, the disclosure contained in U.S. Patent Nos. 5,093,031 and 5,294,644 (Login, et al.); 5,269,958 (de Jager, et al.); 5,427,858 and 5,505,985 ( Nakamura, et al.); 5,676,005 (Balliett, et al.); 5,962,390 (Flynn, et al.); and 5,238,587 (Smith et al.); and the compositions contained therein, Table I of "Exhibit A" summarizes my findings regarding the properties of the compositions disclosed in each reference. "Exhibit B" contains an industry reference found on the internet at website: "[aic.stanford.edu/sg/bpg/annual/v03/bp03-04.html](http://aic.stanford.edu/sg/bpg/annual/v03/bp03-04.html)" and

Application Number: 10/027,160  
Response Dated: October 6, 2006

provides an equation that can be used to calculate the Kauri-Butanol (KB) values of compounds where the Hildebrand solubility parameter is greater than 15.6. "Exhibit C" displays a table of properties, including the KB value, of CFC 113 fluorinated compounds reported in "Triad Project Summary", WR-ALC/EMPP, Robins Air Force Base, GA, Science Applications International Corp., October 2000), and can be found on the internet at website: "www.em.robins.af.mil/TRIAD/pdf/gbab.pdf- Supplemental Result". Example C is an example of a Table of properties that can be found for commonly used solvents.

(9) In view of the above, the disclosure contained in U.S. Patent Nos. 5,093,031 and 5,294,644 (Login et al.) and the disclosure made in our pending patent application USSN 10/027,160, the following statements can be made:

a) The patents of Login et al. disclose lactams compounds that are used as surfactants for a variety of types of cleaning, including aqueous laundering and non-aqueous laundering. The references mention using "fluorinated dry-cleaning compounds" in non-aqueous laundering.

b) The patents of Login et al. do not disclose a working fluid as set forth in the pending patent application. All of the compounds disclosed in these patents are non-reactive. In addition, to the best of my knowledge, the fluorinated dry-cleaning compounds predominantly used in industry at the time the patents of Login et al. were filed, were the chlorinated fluorocarbons (CFC compounds) such as CFC 113 (commonly known as Freon) which have since been outlawed for use in dry cleaning by the EPA. Exhibit C shows that CFC 113 has a KB value greater than 30.

c) The patents of Login et al. do not disclose a fragrance used with non-aqueous cleaning compounds, as set forth in the pending patent application.

(10) In view of the above, the disclosure contained in U.S. Patent No. 5,269,958 (de Jager) and the disclosure made in our pending patent application USSN 10/027,160, the following statements can be made:

a) The patent of de Jager does not disclose a working fluid as set forth in the

Application Number: 10/027,160  
Response Dated: October 6, 2006

pending patent application. All of the compounds disclosed in the de Jager patent are aqueous compounds, reactive, and polar. In addition, all of the compounds disclosed in these patents have a KB value greater than 30.

b) The de Jager patent does not disclose an additive comprising a fragrance as set forth in the pending patent application.

(11) In view of the above, the disclosure contained in U.S. Patent Nos. 5,427,858 and 5,505,985 (Nakamura et al.), and the disclosure made in our pending patent application USSN 10/027,160, the following statements can be made:

a) The Nakamura et al. patents disclose solvent compounds unrelated to the dry-cleaning industry. The compounds disclosed are used as solvents in polymerization reactions.

b) The Nakamura et al. patents do not disclose a working fluid, that carries a washing additive, as set forth in the pending patent application.

c) The Nakamura et al. patents do not disclose a washing additive as set forth in the pending patent application.

d) The Nakamura et al. patents do not disclose a washing additive which includes a fragrance as set forth in the pending patent application.

(12) In view of the above, the disclosure contained in U.S. Patent No. 5,676,005 (Balliett), and the disclosure made in our pending patent application USSN 10/027,160, the following statements can be made:

a) The Balliett patent discloses solvent compounds unrelated to the dry-cleaning industry. The compounds disclosed are used as a lubricant for drawing wire.

b) The Balliett patent does not disclose a working fluid, that carries a washing additive, as set forth in the pending patent application.

c) The Balliett patent does not disclose a washing additive as set forth in the pending patent application.

d) The Balliett patent does not disclose a washing additive which includes a

Application Number: 10/027,160  
Response Dated: October 6, 2006

fragrance as set forth in the pending patent application.

(13) In view of the above, the disclosure contained in U.S. Patent No. 5,962,390 (Flynn et al.) and U.S. Patent No. 5,238,587 (Smith et al.), and the disclosure made in our current patent application USSN 10/027,160, the following points can be made:

a) The Flynn et al. patent does not disclose a washing additive which includes a fragrance as set forth in the pending patent application.

b) The Smith et al. patent porous substrate sheet impregnated with a gelled liquid cleaning composition. Smith et al. does not disclose a wash liquor as set forth in the pending patent application.

c) To the best of my knowledge, there are no past or present teachings which disclose non-aqueous wash liquors containing a washing additive which includes a perfume. For example, considering the references of record, the Login et al. patents (U.S. Patent Nos. 5,093,031 and 5,294,644) described above, disclose non-aqueous wash liquors and aqueous detergents, however, only the aqueous detergents include a perfume. None of the non-aqueous wash liquors contain perfume, nor do the wash additives used in the non-aqueous wash liquors contain perfume. Thus, as evidenced by long-time industry practices in fabric dry-cleaning, one of ordinary skill in the art would not be motivated to include perfume in a wash additive of a non-aqueous wash liquor composition as set forth in the pending patent application.

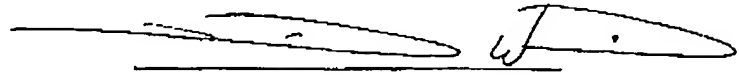
(14) Accordingly, U.S. Patent No. 5,093,031 (Login, et al.), U.S. Patent No. 5,294,644 (Login, et al.), U.S. Patent No. 5,269,958 (de Jager, et al.), U.S. Patent No. 5,427,858 (Nakamura, et al.), U.S. Patent No. 5,505,985 (Nakamura, et al.), U.S. Patent No. 5,676,005 (Balliett, et al.), U.S. Patent No. 5,962,390 (Flynn, et al.), U.S. Patent No. 5,238,587 (Smith, et al.) fail to disclose, teach or suggest a wash liquor as recited in pending claims 79 through 81 and 83 through 88 of the present patent application USSN 10/027,160.

Application Number: 10/027,160  
Response Dated: October 6, 2006

(15) Our invention is a departure from pre-existing wash liquors used in the dry-cleaning industry. Previous to present patent application USSN 10/027,160, working fluids of the wash liquor were specifically chosen to chemically clean the fabric. In some cases, these working fluids were used in conjunction with washing additives which were used to further clean the clothes, or were provided to function as surfactants, for example. The working fluid of the present invention is non-reactive, and yet facilitates mechanical cleaning. We have found that fabrics can be cleaned with excellent results using a working fluid as recited by the properties of the pending claims and used in conjunction with a washing additive. All of the compositions disclosed in each of the cited references discussed above do not include the combined properties of a wash liquor described in our current patent application, namely, a wash liquor which contains a working fluid that is non-aqueous, non-reactive, non-oleophilic, apolar, and which has a KB value of less than or equal to 30, and a washing additive that includes a fragrance.

(16) I, Tremitchell Wright, declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful, false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Dated: 10/6/06



Tremitchell Wright

**EXHIBIT A**

Reference	Login et al. 5,093,031; 5,294,644	de Jager 5,269,958	Nakamura et al. 5,427,858; 5,505,985	Balliett 5,676,005	Flynn et al. 5,962,390	Smith et al. 5,238,587
Compounds Disclosed	Freon 113 CFC 113	Dimethoxy- methane water	HFE and others	PFC and others	HFE and others	Glycol ethers CFC, HC
Aqueous or Non- aqueous	Aqueous and Non-aqueous	Aqueous	Non-aqueous	Non- aqueous	Non-aqueous	Aqueous
Reactive or Non- reactive	Reactive	Reactive	Non-reactive	Non-reactive	Non-reactive	Reactive
Oleophilic or Non- oleophilic	Non- oleophilic	Non- oleophilic	Non-oleophilic	Non- oleophilic	Non-oleophilic	Oleophilic and non-oleophilic
Apolar or Polar	Polar and apolar	Polar	Apolar	Apolar	Apolar	Polar and apolar
KB Value	KB greater than 30	KB greater than 30	$KB \leq 30$	$KB \leq 30$	$KB \leq 30$	KB greater than 30 for apolar compounds
Process	Dry cleaning	Spot cleaning	Polymer- ization	Wire- drawing lubricant	Spot Cleaning	Refreshing
Washing Additives	Washing additives disclosed	yes	no	no	yes	yes
Fragrance	No fragrances for non- aqueous compositions	No fragrances	No fragrances	No fragrances	No fragrances	Fragrances
Comments	CFC compoundso utlawed by EPA	This is a polar fluid.	This patent is not related to laundry	This patent is not related to laundry		Aqueous

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OCT 06 2006

EXHIBIT BSource: Solubility Parameters: Theory and ApplicationWebsite: [aic.stanford.edu/sg/bpg/annual/v03/bp03-04.html](http://aic.stanford.edu/sg/bpg/annual/v03/bp03-04.html)

Fig. 2 Relationship Between Kauri-Butanol Number and Hildebrand Parameter

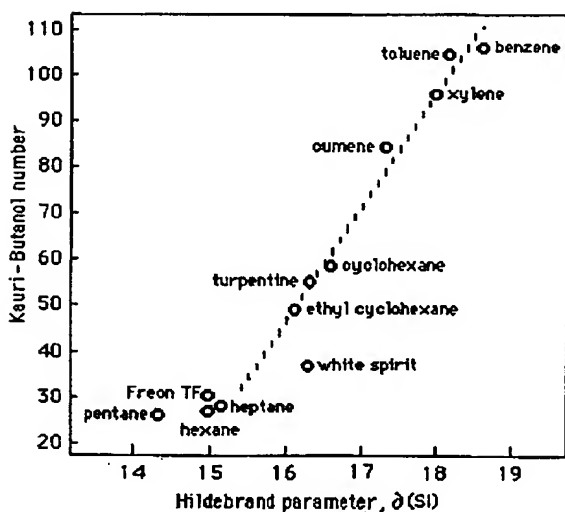


Figure 2 illustrates an almost direct relationship between KB values and Hildebrand values. This relationship is linear for solvents with KB values greater than 35 and can be expressed:

$$\delta/\text{MPa}^{1/2} = 0.04 \text{ KB} + 14.2 \quad (5)$$



**Table 3, Hansen Parameters for Solvents at 25°C**(values selected from Hansen's 1971 parameters listed in *Handbook of Solubility Parameters*, Allan F. M. Barton, Ph.D., CRC Press, 1983, page 153-157)

Solvent	$\delta/\text{MPa}^{1/2}$			
	$\delta_t$	$\delta_d$	$\delta_p$	$\delta_h$
<b>Alkanes</b>				
n-Butane	14.1	14.1	0.0	0.0
n-Pentane	14.5	14.5	0.0	0.0
n-Hexane	14.9	14.9	0.0	0.0
n-Heptane	15.3	15.3	0.0	0.0
n-Octane	15.5	15.5	0.0	0.0
Isooctane	14.3	14.3	0.0	0.0
n-Dodecane	16.0	16.0	0.0	0.0
Cyclohexane	16.8	16.8	0.0	0.2
Methylcyclohexane	16.0	16.0	0.0	0.0
<b>Aromatic Hydrocarbons</b>				
Benzene	18.6	18.4	0.0	2.0
Toluene	18.2	18.0	1.4	2.0
Napthalene	20.3	19.2	2.0	5.9
Styrene	19.0	18.6	1.0	4.1
o-Xylene	18.0	17.8	1.0	3.1
Ethyl benzene	17.8	17.8	0.6	1.4
p- Diethyl benzene	18.0	18.0	0.0	0.6
<b>Halohydrocarbons</b>				
Chloro methane	17.0	15.3	6.1	3.9
Methylene chloride	20.3	18.2	6.3	6.1
1,1 Dichloroethylene	18.8	17.0	6.8	4.5
Ethylene dichloride	20.9	19.0	7.4	4.1
Chloroform	19.0	17.8	3.1	5.7
1,1 Dichloroethane	18.5	16.6	8.2	0.4
Trichloroethylene	19.0	18.0	3.1	5.3
Carbon tetrachloride	17.8	17.8	0.0	0.6
Chlorobenzene	19.6	19.0	4.3	2.0
o-Dichlorobenzene	20.5	19.2	6.3	3.3
1,1,2 Trichlorotrifluoroethane	14.7	14.7	1.6	0.0
<b>Ethers</b>				
Tetrahydrofuran	19.4	16.8	5.7	8.0
1,4 Dioxane	20.5	19.0	1.8	7.4
Diethyl ether	15.8	14.5	2.9	5.1
Dibenzyl ether	19.3	17.4	3.7	7.4
<b>Ketones</b>				

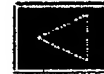
Acetone	20.0	15.5	10.4	7.0
Methyl ethyl ketone	19.0	16.0	9.0	5.1
Cyclohexanone	19.6	17.8	6.3	5.1
Diethyl ketone	18.1	15.8	7.6	4.7
Acetophenone	21.8	19.6	8.6	3.7
Methyl isobutyl ketone	17.0	15.3	6.1	4.1
Methyl isoamyl ketone	17.4	16.0	5.7	4.1
Isophorone	19.9	16.6	8.2	7.4
Di-(isobutyl) ketone	16.9	16.0	3.7	4.1
<b>Esters</b>				
Ethylene carbonate	29.6	19.4	21.7	5.1
Methyl acetate	18.7	15.5	7.2	7.6
Ethyl formate	18.7	15.5	7.2	7.6
Propylene 1,2 carbonate	27.3	20.0	18.0	4.1
Ethyl acetate	18.1	15.8	5.3	7.2
Diethyl carbonate	17.9	16.6	3.1	6.1
Diethyl sulfate	22.8	15.8	14.7	7.2
n-Butyl acetate	17.4	15.8	3.7	6.3
Isobutyl acetate	16.8	15.1	3.7	6.3
2-Ethoxyethyl acetate	20.0	16.0	4.7	10.6
Isoamyl acetate	17.1	15.3	3.1	7.0
Isobutyl isobutyrate	16.5	15.1	2.9	5.9
<b>Nitrogen Compounds</b>				
Nitromethane	25.1	15.8	18.8	5.1
Nitroethane	22.7	16.0	15.5	4.5
2-Nitropropane	20.6	16.2	12.1	4.1
Nitrobenzene	22.2	20.0	8.6	4.1
Ethanolamine	31.5	17.2	15.6	21.3
Ethylene diem me	25.3	16.6	8.8	17.0
Pyridine	21.8	19.0	8.8	5.9
Morpholine	21.5	18.8	4.9	9.2
Aniline	22.6	19.4	5.1	10
N-Methyl-2-pyrrolidone	22.9	18.0	12.3	7.2
Cyclohexylamine	18.9	17.4	3.1	6.6
Quinoline	22.0	19.4	7.0	7.6
Formamide	36.6	17.2	26.2	19.0
N,N-Dimethylformamide	24.8	17.4	13.7	11.3
<b>Sulfur Compounds</b>				
Carbon disulfide	20.5	20.5	0.0	0.6
Dimethylsulphoxide	26.7	18.4	16.4	10.2
Ethanethiol	18.6	15.8	6.6	7.2
<b>Alcohols</b>				
Methanol	29.6	15.1	12.3	22.3
Ethanol	26.5	15.8	8.8	19.4
Allyl alcohol	25.7	16.2	10.8	16.8

1-Propanol	24.5	16.0	6.8	17.4
2-Propanol	23.5	15.8	6.1	16.4
1-Butanol	23.1	16.0	5.7	15.8
2-Butanol	22.2	15.8	5.7	14.5
Isobutanol	22.7	15.1	5.7	16.0
Benzyl alcohol	23.8	18.4	6.3	13.7
Cyclohexanol	22.4	17.4	4.1	13.5
Diacetone alcohol	20.8	15.8	8.2	10.8
Ethylene glycol monoethyl ether	23.5	16.2	9.2	14.3
Diethylene glycol monomethyl ether	22.0	16.2	7.8	12.7
Diethylene glycol monoethyl ether	22.3	16.2	9.2	12.3
Ethylene glycol monobutyl ether	20.8	16.0	5.1	12.3
Diethylene glycol monobutyl ether	20.4	16.0	7.0	10.6
1-Decanol	20.4	17.6	2.7	10.0
<b>Acids</b>				
Formic acid	24.9	14.3	11.9	16.6
Acetic acid	21.4	14.5	8.0	13.5
Benzoic acid	21.8	18.2	7.0	9.8
Oleic acid	15.6	14.3	3.1	14.3
Stearic acid	17.6	16.4	3.3	5.5
<b>Phenols</b>				
Phenol	24.1	18.0	5.9	14.9
Resorcinol	29.0	18.0	8.4	21.1
m-Cresol	22.7	18.0	5.1	12.9
Methyl salicylate	21.7	16.0	8.0	12.3
<b>Polyhydric Alcohols</b>				
Ethylene glycol	32.9	17.0	11.0	26.0
Glycerol	36.1	17.4	12.1	29.3
Propylene glycol	30.2	16.8	9.4	23.3
Diethylene glycol	29.9	16.2	14.7	20.5
Triethylene glycol	27.5	16.0	12.5	18.6
Dipropylene glycol	31.7	16.0	20.3	18.4
Water	47.8	15.6	16.0	42.3

**EXHIBIT C**

WR-ALC/EMPP  
Robins Air Force Base, GA

Science Applications International Corp.  
Warner Robins, GA  
October 2000

**TRIAD Project Summary**

**Gyroscope Bearing  
Cleaning**

**Table 2  
Physical Properties of Single Solvent  
Alternatives**

Test Property	CFC-113	Akzo VG	HFE- 71DE	Veratrol MCA
Boiling Point (°F)	117	160	106	102
Specific Gravity	1.57	1.20	1.37	1.41
Viscosity (cP)	0.68	0.49	0.45	0.49
Surface Tension (dyne/cm)	17.3	25.4	16.6	15.2
Kb Value	31	125	27	20